Amendments to the Claims

The following Listing of Claims replaces all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A method of interfacing with a machine, comprising:

at each of multiple capture times, contemporaneously acquiring ~~sets of contemporaneous images of an interactive space from~~a respective image from each of multiple ~~respective~~ fields of view defining an interactive space to create a respective set of contemporaneous images;

detecting an input target in the acquired images;

computing two-dimensional coordinates of the input target detected in the acquired images;

constructing a spatiotemporal input data structure linking each of the capture times to the computed two-dimensional coordinates of the input target in each of the ~~coordinates computed from~~ contemporaneously acquired images ~~to~~in a respective ~~reference times~~one of the sets of contemporaneous images;

processing the spatiotemporal input data structure to identify an input instruction; and

executing the identified input instruction on the machine.

Claim 2 (original): The method of claim 1, wherein images of the interactive space are acquired from at least one stereoscopic pair of fields of view directed along substantially parallel axes intersecting the interactive space.

Claim 3 (original): The method of claim 1, wherein images of the interactive space are acquired from at least three different fields of view.

Claim 4 (original): The method of claim 1, wherein detecting the input target in the acquired images comprises comparing values of pixels in the acquired images to at least one threshold pixel value.

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Claim 5 (original): The method of claim 4, wherein computing coordinates of the input target comprises computing coordinates of centroids of respective groups of pixels in the acquired images with values greater than the at least one threshold pixel value.

Claim 6 (original): The method of claim 4, wherein detecting the input target in the acquired images comprises segmenting foreground pixels from background pixels in the acquired images.

Claim 7 (canceled)

Claim 8 (currently amended): The method of claim ~~7~~1, further comprising computing calibration parameters for the multiple fields of view.

Claim 9 (original): The method of claim 8, wherein computing coordinates of the detected input target comprises computing three-dimensional coordinates of the input target in the interactive space based on the computed two-dimensional coordinates and the computed calibration parameters.

Claim 10 (currently amended): The method of claim 9, wherein the spatiotemporal input data structure additionally links each of the capture times to respective~~two-dimensional coordinates and~~ three-dimensional coordinates of the input target computed from the computed two-dimensional coordinates of the input target in each of the contemporaneously acquired images in a respective one of the sets of contemporaneous images ~~to respective reference times~~.

Claim 11 (original): The method of claim 1, further comprising acquiring color values of the detected input target in the acquired images.

Claim 12 (currently amended): The method of claim 11, wherein the spatiotemporal input data structure additionally links each of the capture times to respective ~~input target coordinates and associated~~ color values ~~acquired~~ determined from the contemporaneously acquired images in ~~at~~o respective one of the sets of contemporaneous images~~reference times~~.

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Claim 13 (original): The method of claim 1, wherein the spatiotemporal input data structure is constructed in the form of a linked list of data records.

Claim 14 (currently amended): The method of claim 1, wherein processing the spatiotemporal input data structure comprises identifying traces of the input target in the interactive space, each trace including being defined by a respective set of connected data items in the spatiotemporal input data structure.

Claim 15 (original): The method of claim 14, wherein identifying traces comprises detecting state change events and segmenting traces based on detected state change events.

Claim 16 (original): The method of claim 14, wherein identifying traces comprises computing coordinates of bounding regions encompassing respective traces.

Claim 17 (original): The method of claim 16, wherein the computed bounding region coordinates are two-dimensional coordinates of areas in the acquired images.

Claim 18 (original): The method of claim 16, wherein the computed bounding region coordinates are three-dimensional coordinates of volumes in the interactive space.

Claim 19 (original): The method of claim 14, wherein the spatiotemporal input data structure is processed to interpret the identified input target traces.

Claim 20 (original): The method of claim 19, further comprising comparing an identified trace to a predefined representation of an input gesture corresponding to a respective input instruction.

Claim 21 (original): The method of claim 20, wherein processing the spatiotemporal input data structure comprises translating the trace into a predefined alphanumeric character.

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Claim 22 (original): The method of claim 19, further comprising comparing an identified trace to a location in the interactive space corresponding to a virtual interactive object.

Claim 23 (original): The method of claim 22, wherein the virtual interactive object corresponds to a virtual machine instruction input.

Claim 24 (original): The method of claim 23, wherein the virtual machine instruction input is predefined.

Claim 25 (original): The method of claim 23, further comprising constructing the virtual machine instruction input in response to processing of at least one identified input target trace.

Claim 26 (original): The method of claim 23, wherein the virtual machine instruction input corresponds to a respective mode of interpreting traces.

Claim 27 (original): The method of claim 1, wherein executing the identified input instruction comprises displaying an image in accordance with the identified input instruction.

Claim 28 (currently amended): The method of claim 27, wherein the ~~displayed image~~displaying comprises displaying a combination of image data generated based on the acquired images and machine-generated virtual image data.

Claim 29 (original): The method of claim 27, further comprising displaying a sequence of images at the display location showing a virtual object being manipulated in accordance with one or more identified input instructions.

Claim 30 (currently amended): A method of interfacing with a machine, comprising:
acquiring sets of contemporaneous images of an interactive space from multiple respective fields of view;
detecting an input target in the acquired images;

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computing coordinates of the input target detected in the acquired images;

constructing a spatiotemporal input data structure linking input target coordinates computed from contemporaneous images to respective reference times;

processing the spatiotemporal input data structure to identify an input instruction; and

executing the identified input instruction on the machine; and

~~The method of claim 1, further comprising~~ interpolating between fields of view to generate a synthetic view of the interactive space.

Claim 31 (currently amended): A system for interfacing with a machine, comprising:

multiple imaging devices configured to contemporaneously acquire, at each of multiple capture times, ~~sets of contemporaneous images of an interactive space~~a respective image from each of multiple ~~respective~~fields of view defining an interactive space to create a respective set of contemporaneous images; and

a processing module configured to detect an input target in the acquired images, compute two-dimensional coordinates of the input target detected in the acquired images, construct a spatiotemporal input data structure linking each of the capture times to the computed two-dimensional coordinates of the input target ~~coordinates computed from contemporaneous~~in each of the contemporaneously acquired images ~~to~~in a respective ~~reference times~~one of the sets of contemporaneous images, process the spatiotemporal input data structure to identify an input instruction, and ~~executing~~execute the identified input instruction on the machine.

Claim 32 (currently amended): A machine-readable medium storing machine-readable instructions for causing a machine to:

at each of multiple capture times, contemporaneously acquire ~~sets of contemporaneous images of an interactive space~~a respective image from each of multiple ~~respective~~fields of view defining an interactive space to create a respective set of contemporaneous images;

detect an input target in the acquired images;

compute two-dimensional coordinates of the input target detected in the acquired images;

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construct a spatiotemporal input data structure linking <u>each of the capture times to the computed two-dimensional coordinates of the</u> input target <u>in each of the</u> ~~coordinates computed from~~-contemporaneous<u>ly acquired</u> images ~~to~~<u>in</u> a respective ~~reference times~~<u>one of the sets of contemporaneous images</u>;

process the spatiotemporal input data structure to identify an input instruction; and

execute the identified input instruction on the machine.

Claim 33 (currently amended): A method of interfacing with a machine, comprising:

displaying an image at a display location disposed between a viewing space and an interactive space, wherein the displayed image is viewable from a perspective in the viewing space;

acquiring images of the interactive space from ~~at least one~~<u>a</u> field of view<u> directed toward the interactive space along an optical axis intersecting a central area of the display location</u>;

detecting an input target in the acquired images;

computing coordinates of the input target detected in the acquired images;

identifying an input instruction based on the computed input coordinates; and

executing the identified input instruction on the machine.

Claim 34 (original): The method of claim 33, wherein the display location corresponds to a display area of a portable electronic device.

Claim 35 (original): The method of claim 33, wherein the display location corresponds to a display area embedded in a desktop surface.

Claim 36 (original): The method of claim 33, wherein displaying the image comprises projecting the image onto a surface.

Claim 37 (original): The method of claim 33, wherein acquiring images comprises acquiring images of the interactive space from at least one field of view disposed between the display location and the interactive space.

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Claim 38 (canceled)

Claim 39 (original): The method of claim 33, wherein acquiring images comprises acquiring images of the interactive space from multiple fields of view.

Claim 40 (original): The method of claim 39, further comprising interpolating between fields of view to display an image at the display location corresponding to a synthetic view of the interactive space.

Claim 41 (original): The method of claim 39, further comprising computing calibration parameters for the multiple fields of view.

Claim 42 (original): The method of claim 41, wherein computing coordinates of the detected input target comprises computing three-dimensional coordinates of the input target in the interactive space based on the computed calibration parameters.

Claim 43 (original): The method of claim 33, wherein detecting the input target in the acquired images comprises comparing values of pixels in the acquired images to at least one threshold pixel value.

Claim 44 (original): The method of claim 43, wherein computing coordinates of the input target comprises computing coordinates of centroids of respective groups of pixels in the acquired images with values greater than the threshold.

Claim 45 (original): The method of claim 43, wherein detecting the input target in the acquired images comprises segmenting foreground pixels from background pixels in the acquired images.

Claim 46 (original): The method of claim 33, wherein computing coordinates of the detected input target comprises computing two-dimensional coordinates of the input target detected in the acquired images.

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Claim 47 (original): The method of claim 33, wherein identifying an input instruction comprises identifying traces of the input target in the interactive space.

Claim 48 (original): The method of claim 47, wherein identifying traces comprises detecting state change events and segmenting traces based on detected state change events.

Claim 49 (original): The method of claim 47, wherein identifying traces comprises computing coordinates of bounding regions encompassing respective traces.

Claim 50 (original): The method of claim 49, wherein the computed bounding region coordinates are two-dimensional coordinates of areas in the acquired images.

Claim 51 (original): The method of claim 49, wherein the computed bounding region coordinates are three-dimensional coordinates of volumes in the interactive space.

Claim 52 (original): The method of claim 47, wherein identifying the input instruction comprises interpreting the identified input target traces.

Claim 53 (original): The method of claim 52, further comprising comparing an identified trace to a predefined representation of an input gesture corresponding to a respective input instruction.

Claim 54 (original): The method of claim 53, wherein processing the spatiotemporal input data structure comprises translating the trace into a predefined alphanumeric character.

Claim 55 (original): The method of claim 52, further comprising comparing an identified trace to a location in the interactive space corresponding to a virtual interactive object.

Claim 56 (original): The method of claim 55, wherein the virtual interactive object corresponds to a virtual machine instruction input.

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Claim 57 (original): The method of claim 56, wherein the virtual machine instruction input is predefined.

Claim 58 (original): The method of claim 56, further comprising constructing the virtual machine instruction input in response to processing of at least one identified input target trace.

Claim 59 (original): The method of claim 56, wherein the virtual machine instruction input corresponds to a respective mode of interpreting traces.

Claim 60 (original): The method of claim 33, wherein executing the identified input instruction comprises displaying an image at the display location in accordance with the identified input instruction.

Claim 61 (original): The method of claim 60, wherein the displayed image comprises a combination of image data generated based on the acquired images and machine-generated virtual image data.

Claim 62 (original): The method of claim 60, further comprising displaying a sequence of images at the display location showing a virtual object being manipulated in accordance with one or more identified input instructions.

Claim 63 (currently amended): A system of interfacing with a machine, comprising:
a display configured to present an image at a display location disposed between a viewing space and an interactive space, wherein the displayed image is viewable from a perspective in the viewing space;
at least one imaging device configured to acquire images of the interactive space from at least one respectivea field of view directed toward the interactive space along an optical axis intersecting a central area of the display location; and
a processing system configured to detect an input target in the acquired images, compute coordinates of the input target detected in the acquired images, identify an input

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instruction based on the computed input coordinates, and execute the identified input instruction on the machine.

Claim 64 (currently amended): A machine-readable medium storing machine-readable instructions for causing a machine to:

display an image at a display location disposed between a viewing space and an interactive space, wherein the displayed image is viewable from a perspective in the viewing space;

acquire images of the interactive space from ~~at least one~~a field of view directed toward the interactive space along an optical axis intersecting a central area of the display location;

detect an input target in the acquired images;

compute coordinates of the input target detected in the acquired images;

identify an input instruction based on the computed input coordinates; and

execute the identified input instruction on the machine.

65.   The method of claim 1, further comprising interpolating between ones of the images contemporaneously acquired from ones of the fields of view to generate a synthetic view of the interactive space.